

# Inventions Resulting From Public Health Service Extramural Grants and Awards

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THE PUBLIC HEALTH SERVICE is responsible for conducting and supporting research into the causes, diagnosis, prevention, and treatment of diseases and disabilities of man and for protecting the public interest in inventions resulting from the work supported. In addition to conducting extensive research in its own laboratories, the Service supports research and research training in nonprofit institutions throughout the world.

The policy of the Service is that results of research and training supported by public monies should be used in the manner which would best serve the public interest. This report has been compiled for the information of clinicians, pharmaceutical and instrument manufacturers, organic chemists, biochemists, and others interested in research or other areas of biomedical health.

## Inventions

Scientific and technological advances attributable, in varying degrees to this expenditure of public funds frequently include inventions, some of which may be patentable. Inventions originating during work on Public Health Service supported grants and awards fall into three general categories.

1. *Processes, procedures, and methods* are usually techniques for preparing substances or making clinical tests. These include a process for photosynthetic conversion of organic waste

by algal-bacterial symbiosis, a method for synthesizing infectious nucleic acids of plant viruses, an assay for intrinsic factor, and a method for determining blood cholesterol.

2. *Compounds and materials* are generally organic substances. Among those mentioned in this report are a highly purified ovine prolactin, an antigen for diagnosis of cysticercosis, a new antibiotic, and an insecticide derived from turnips.

3. *Devices and apparatus* not infrequently can be used to aid a patient during an emergency. Examples of these are artificial heart valves, a pulmonary ventilator for infants, a membrane lung-kidney, and a safety seat belt.

## Protecting the Public Interest

Questions of Government equity and protection of the public interest must be resolved whenever a discovery or invention is developed from research supported in whole or in part by Public Health Service funds. The Service asserts that dissemination of inventive advances resulting from such support usually can be preserved adequately by dedication of inventions to the public by publication through normal scientific media. In some circumstances, however, use of the patent process may stimulate development of an invention more adequately and quickly for widest use.

Each grant incorporates an agreement binding the grantee organization to report to the Public Health Service any inventions made in the course of supported research. Prior to March 1, 1962, inventions were reported at irregular intervals on the initiative of the grantee organization or the scientist-investigator (inventor). Grantee organizations are now re-

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**Table 1. Government-owned patents issued 1951-66 on inventions resulting from Public Health Service grants and awards**

Number and date of U.S. patent	Inventor	Title of patent
2, 557, 164 1951	Wender, Simon H.....	Method of isolating quercitrin from peanut hulls.
2, 569, 300 1951	Fieser, Louis F., and Rajagopalan, Srinivasa.	Selective oxidation of steroid alcohols.
2, 604, 474 1952	Elderfield, Robert C., and Werble, Eleanor.	Process for preparation and manufacture of 6-methoxy-8-(4-amino-1-methylbutylamino)-quinoline (primaquine).
2, 705, 489 1955	Trexler, Philip C.....	Biological apparatus.
2, 786, 464 1957	-----do-----	Do.
2, 845, 929 1958	Strumia, Max M.....	Apparatus for the collection and cooling of blood.
2, 918, 409 1959	Horrigan, Daniel L.....	Hypochromic anemia factor and process of producing same.
2, 940, 981 1960	Trurnit, Hans J.....	Method for isolating and crystallizing chlorophyll.
2, 999, 792 1961	Segre, Diego.....	Serologic test.
3, 009, 917 1961	Kupchan, S. Morris, and Ayres, C. Ian.	Protoverine 6,7-diacetate 15(1)2'-methyl-butyrate and its preparation.
3, 016, 284 1962	Trexler, Philip C.....	Process for introducing sterile material in apparatus having controlled atmosphere.
3, 029, 244 1962	Lyle, Robert E., and Troscianiec, Henry J.	Aroylpiperidinols and esters thereof.
3, 050, 791 1962	Trexler, Philip C.....	Sealed door for a compartment having a controlled environment.
3, 051, 163 1962	-----do-----	Isolating device.
3, 051, 164 1962	-----do-----	Jacket isolator for use in sterile techniques.
3, 059, 831 1962	-----do-----	Connection between 2 sealed chambers and method of making the same.
3, 066, 142 1962	Kupchan, S. Morris.....	Esters of protoverine.
3, 066, 143 1962	-----do-----	Do.
3, 066, 144 1962	-----do-----	Do.
3, 096, 250 1963	Ingraham, Joseph S.....	Novel particulate antigens and process.
3, 102, 843 1963	Goldman, Dexter S., and Lornitzo, Frank A.	Isolation of mycoribnin-T6P.
3, 105, 009 1963	Roberts, Eugene.....	Anti-mitotic chemotherapeutic compounds.
3, 105, 089 1963	Kupchan, S. Morris.....	Angelic acid esters.
3, 167, 485 1965	Katchalski, Ephraim, and Bar Eli, Atara.	Water insoluble modified enzyme.
3, 170, 246 1965	Koltun, Walter L.....	Space filling atomic units and connectors for molecular models.
3, 200, 142 1965	Bowen, Raphael L.....	Surface-active comonomer and method of preparation.
3, 201, 387 1965	Heidelberger, Charles.....	5-trifluoromethyluracil, derivatives thereof, and processes for preparing the same.
3, 229, 687 1966	Holter, Norman J.....	Electrocardio recording and reproducing system.
3, 241, 920 1966	Zweig, Gunter.....	Method of measuring organic chloride contamination of milk.

quired to submit, as part of the request for renewal or continuation of support, an annual statement listing all inventions which were conceived, and/or reduced to practice, or made the subject of a patent application by persons engaged in the work supported. The statement is also required upon termination of Public Health Service support.

Inventions reported to the Service permit the Surgeon General of the Public Health Service to exercise his authority, under Department of Health, Education, and Welfare regulations, to

determine what invention rights should be reserved to the U.S. Government and whether filing an application for a patent is in the public interest. Patents for each of the 29 inventions concerning which the Surgeon General made an individual formal determination to protect the Government's interest by acquiring a Government-owned patent are listed in table 1. The first such patent was obtained in 1951.

Department regulations also empower the Surgeon General to delegate to nonprofit institutions the authority to make determinations on

**Table 2. Patents issued on inventions resulting from Public Health Service grants and awards under institutional agreements with the Surgeon General,<sup>1</sup> 1957-66**

Number and date of U.S. patent	Inventor	Title of patent
2,783,233 1957	Rapoport, Henry, and Masamune, Tatoru.	10-hydroxyalkaloids and method of making same.
2,854,002 1958	DeWall, R. A., and Lillehei, Clarence W.	Oxygenator.
2,867,945 1959	Gotaas, Harold B., and Oswald, William J.	Process of photosynthetic conversion of organic waste by algal-bacterial symbiosis.
2,901,398 1959	Perlman, Ely	Ion-exchange purification of allergenic pollen component.
2,955,115 1960	Kummerow, Fred A., and Sakuragi, Taketami.	Long-chain fatty acid esters.
2,966,445 1960	Beers, Roland F.	Submerged fermentation process.
2,982,132 1961	Mendlowitz, Milton	Calorimetric method and apparatus for continuous recording of heat exchange between bodies.
3,010,801 1961	Schulze, Karl L.	Apparatus for control of aerobic decomposition.
3,037,016 1962	Barker, Horace A.	B <sub>12</sub> coenzymes and processes for preparing the same.
3,063,916 1962	Kosikowski, Frank V.	Methods for detecting the presence of antibiotics.
3,074,761 1963	Ryan, J. J.	Safety seat belt.
3,077,470 1963	Burekhalter, Joseph H.	3-(4-hydroxy-3-(aminomethyl)-phenyl)-4-(4-oxyphenyl)-alkanes and alkenes.
3,077,472 1963	do	3-(4-(aminoalkoxy)-phenyl)-4-(4-oxyphenyl)-alkanes and alkenes.
3,138,448 1964	Schulze, Karl L.	Method and apparatus for control of aerobic decomposition.
3,149,060 1964	Dobry, Reuven, and Finn, Robert K.	Continuous electrophoresis device.
3,195,271 1965	Golueke, Clarence G., and Oswald, William J.	Process for culturing and recovering algae.
3,236,944 1966	Jacobs, John E.	Ultrasound visualization systems.

<sup>1</sup> Licenses issued to the U.S. Government.

the disposition of invention rights, provided the institution's policies regarding patents and procedures governing administration of inventions are acceptable to the Service. Agreements conferring this authority are in effect with the following 18 institutions:

California Institute of Technology  
 Cornell University  
 Florida State University  
 Harvard University  
 Iowa State University  
 Massachusetts Institute of Technology  
 Michigan State University  
 Mount Sinai Hospital, New York City  
 Ohio State University  
 Princeton University  
 Purdue University  
 Tufts University  
 University of California  
 University of Illinois  
 University of Kansas  
 University of Minnesota  
 University of Washington  
 Washington State University

Determination to apply for each patent listed in table 2 was made by the grantee institution under the authority delegated by the Surgeon General, and the Government received a non-exclusive, irrevocable, royalty-free license, with power to sublicense for all governmental purposes. The first patent obtained in accordance

with an institutional agreement was issued in 1957.

The 148 inventions listed in table 3 were described in the literature over an 8-year period beginning in 1958. However, formal determination to dedicate these 148 inventions to the public through publication in scientific journals was made by the Surgeon General during calendar years 1963 and 1964.

### Disposition of Inventions Reported

This report lists all patents issued on inventions resulting from Public Health Service support since the inception of the grants program in 1946 through March 1966 and those inventions dedicated to the public by publication during calendar years 1963 and 1964. Throughout the 20 years a total of 1,173 inventions were reported to the Service. It should be noted, however, that very few inventions were reported during the early years; the number has increased steadily since 1958.

Twenty-nine of the 194 inventions listed in this report were patented by the Government, 17 were patented under grantee institutional agreements, and the remaining 148 were dedicated to the public through publication in scientific journals.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication**

Author	Title of invention report	Journal citation
Adamis, Dionysios	New fibrinolytic and anticoagulant enzyme.	Lancet No. 7211: 1070, Nov. 11, 1961.
Adamkiewicz, Vincent W.	Glycemic states and immune responses.	Canad Med Assoc J 88: 806-811, Apr. 13, 1963.
Agnew, William F., and Stromer, George.	Apparatus for the collection of cerebrospinal fluid from the rat.	J Appl Physiol 17: 848, September 1962.
Bachman, Daniel M., and Dragoon, Belle.	Neurospora growth tube.	Arthritis Rheum 7: 726, December 1964.
Bachman, Daniel M., Dragoon, Belle, and John, Sosamma.	Reduction of salicylate to saligenin by neurospora.	Arch Biochem 91: 326, December 1960.
Beal, Charles B., and Stites, Dan P.	Surgical wound isolator.	Med World News 2: 23, Nov. 24, 1961.
Beard, Charles, and Easterday, B. C.	Aerosol apparatus for exposure of large and small animals.	Amer J Vet Res 26: 174-182, January 1965.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Bengtsson, Stellan, Philipson, Lennart, and Albertsson, Per-Ake.	Counter-current distribution of polioviruses in aqueous polymer phase systems.	Biochem Biophys Res Commun 9: 318-322, Oct. 31, 1962. Virology 20: 176-184, May 1963.
Biagi, Francisco, and Pratt, Guadalupe V.	Specific antigen for the diagnosis of cysticercosis.	Rev Inst Med Trop S Paulo 6: 114-116, May-June 1964.
Biggerstaff, Warren, and Stevens, Kenneth L.	General method for the synthesis of 5-substituted 2(5 <i>H</i> )-thiophenones.	J Org Chem 28: 733-736 (1963).
Bolt, Robert J., French, Arthur B., and Pollard, H. Marvin.	Small bowel biopsy capsule-----	Amer J Dig Dis 7: 773-778 September 1962.
Bottini, Albert T., and Dev, Vasu--	Synthesis of alleniminoalkanols ((2-methylene-1-azairidinyl)-alkanols).	J Org Chem 27: 968-973 (1962).
Bottini, Albert T., Millikin, Judith A., and Morris, Clarence J.	Synthesis of 2-vinylloxazolidines and 2-methylenemorpholines.	J Org Chem 29: 373-379 (1964).
Bourmes, William, Kayser, Kenneth, and Lepley, Derward, Jr.	A cardiac conduction system locator---	Surgery 50: 50-57, July 1961.
Briskey, Ernest J., Sayre, Robert N., and Cassens, Robert G.	Apparatus for continuous measurement of muscle extensibility and elasticity prior to and during onset of rigor mortis.	J Food Sci 27: 560-566, November-December 1962.
Brown, Kenneth T.-----	Optical stimulator, microelectrode advancer, and associated equipment for intraretinal neurophysiology in closed mammalian eyes.	J Opt Soc Amer 54: 101-109, January 1964.
Bubel, H. Curt, and Bonventre, Peter F.	An apparatus for preparation of frozen whole animal sections.	J Lab Clin Med 61: 324-328, February 1963.
Burch, George E., et al.-----	Angiocardiocarbo injector-----	JAMA 183: 962-964, Mar. 16, 1963.
Carpino, Louis A.-----	Synthesis of <i>t</i> -butyl <i>S</i> -methylthiolcarbonate.	J Org Chem 28: 1909-1910 (1963).
Carr, Herman E., and Naukkarinen, Irmeli.	Isolation of an aldosterone-like substance from the urine and adrenal incubates of patients with arterial hypertension.	Nature (London) 197: 696-697, Feb. 16, 1963.
Cartwright, Robert S., et al.-----	Open-end caged ball-valve prostheses--	JAMA 180: 6-10, Apr. 7, 1962.
-----Do-----	Prosthetic valve holder-----	J Thorac Cardiovasc Surg 45: 35-46, January 1963.
Case, Barbara, and Valenstein, Elliot S.	Methyl methacrylate monomer, a solvent for removal of implanted electrodes.	Stain Techn 38: 201-202, May 1963.
Cassotta, Louis, Feldstein, Stanley, and Jaffee, Joseph.	Automatic vocal transaction analyzer--	J Exp Anal Behav 7: 99-104, January 1964.
Castelfranco, Paul A., and Deutsch, Deborah B.	Use of polysulfides to remove unwanted residues of chlorotriazine herbicides from soils.	Weeds 10: 244-245, July 1962.
Chatterjee, Asima-----	Marsiline, its chemistry and pharmacology.	J Exp Med Sci (Calcutta) 7: 73-91, December 1963.
Clark, Leland C., and Lyons, Champ.	Enzyme transducer membrane-----	Ann NY Acad Sci 102: 29-45, October 1962.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Clarke, E. R., Martin, Carrol J., and Politoff, Sergei.	Lobarspirometric catheter.....	Dis Chest 34: 1-4, August 1958.
Cochran, George W., et al.....	A cell-free method of synthesizing infectious nucleic acids of plant viruses.	Science 138: 46-48, October 1962.
Cohen, Arthur L.....	Device for concentrating small organisms for sectioning.	J Appl Physics 32: 1637, August 1961.
Cohen, Sasson, Thom, Edna, and Bendich, Aaron.	Series of purine derivatives which include 6-trichloromethylpurine, 6-dichloromethylpurine, 6-chloromethylpurine, 6-tribromomethylpurine, 6-dibromomethylpurine, 6-bromomethylpurine, 6-(trimethoxymethyl) purine and 6-carboxymethyl-purine.	J Org Chem 27: 3545-3549 (1962).
Coltman, Charles A., and Atwell, Robert J.	Modified iontophoresis apparatus.....	Ohio Med J 58: 681-682, June 1962.
Cooper, William G.....	Cooper tissue culture dishes.....	Proc Soc Exp Biol Med 106: 801-803 (1961).
Cowan, John P., MacIntyre, Walter M., and Werkema, George J.	Cascade-Colorado automatic single crystal analysis diffraction.	Acta Crystallogr 16: 221-225, March 1963.
Dauben, William G., and Laug, Paul.	Preparation of $14B^{18}$ -cyclosteroids.....	Tetrahedron Lett No. 11: 453-456 (1962).
Davis, W. Marvin, and Nichols, John R.	Certain improvements made on a self-injector device for small animals.	J Exp Anal Behav 6: 223-235, April 1963.
Delaunois, A. L.....	Automatic cholinesterase activity determination.	Arch Int Pharmacodyn 140: 351-357, Dec. 1, 1962.
Delaunois, A. L., Schaepdryver, A. F., and Piette, Y.	Electroshock threshold method.....	Arch Int Pharmacodyn 136: 242-250, Mar. 1, 1962.
Dolliver, James S., Hilderbromat, A. C., and Riker, A. J.	A chelating agent (ethylenediaminetetraacetic acid) capable of inhibiting the reproduction of a plant parasitic nematode ( <i>Aphelenchoides ritzemabosi</i> ).	Nematologica 7: 294-300 (1962).
Dutta, Amuya K., and Pakrashi, Satyesh C.	A promising drug for blood pressure...	Ann Biochem Exp Med 22: 23-24, January 1962; 129-146, June 1962; 23: 285-298, August 1963.
Eckstein, Richard W., and Driscoll, Thomas E.	Snare for vascular occlusion or narrowing in intact animals.	Proc Soc Exp Biol Med 112: 318-319 (1963).
Edelman, Isidore S., Peterson, Martin J., and Gulzassy, Paul F.	Glass chambers for the measurement of rates of osmotic flow.	J Clin Invest 43: 2185-2194 (1964).
Ehrenfreund, David, and Badia, Pietro.	Weight control apparatus.....	Psychol Rep 6: 339-345 (1960). J Exp Psychol 63: 468-471 (1962).
Elliott, Willard B., and Doebbler, G. F.	Application of on-line computer to low-temperature spectrophotometry.	Physiologist 5: 135, August 1962.
Ellsworth, Orvall T.....	Polar stereotaxic system.....	Fed Proc 22: (Abstracts) 400 (1963).
Evans, W. L.....	Photometer head for microspectrophotometer.	Rev Sci Instru 35: 305-306, March 1964.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Ferster, C. B., and Aprison, M. H.	An improved continuous multiple-animal training apparatus.	J Exp Anal Behav 3: 165-166, April 1960.
Foster, John W., Cowan, Robert M., and Maag, Ted A.	Explosive decompression device.....	J Bact 83: 330-334, February 1962.
Fregnan, Grancarlo B., and Smith, Donald W.	A new antibiotic specific for mycobacteria.	J Bact 83: 1069-1076, May 1962.
Friedman, Orrie M., et al.....	Synthesis of phosphoramidate mustards of possible use in cancer chemotherapy.	J Med Chem 6: 50-58, January 1963.
Galletti, Pierre M., Peirce, E. Converse, and Hopf, Max A.	Membrane lung-kidney.....	Trans Amer Soc Artif Intern Organs 8: 47-52, June 1962.
Gensler, Walter J., and Gatsonis, Christos.	Conversion of picropodophyllin to podophyllotoxin.	J Amer Chem Soc 84: 1748-1749 (1962).
Gilow, Helmuth, and Jacobus, John.	Preparation of some pyrimido-(4,5- <i>e</i> ) (1,2,4) thiadiazines.	J Org Chem 28: 1994-1998 (1963).
Glagov, Seymour, Eckner, Friedrich, and Lev, Maurice.	Controlled pressure fixation apparatus..	Arch Path 76: 640-646, December 1963.
Glantz, Paul J.....	Test tube holder.....	J Bact 86: 601-602, September 1963.
Glick, David, and Von Redlich, Dorothy.	Fluorometer cuvette adapters for measurements.	Anal Biochem 6: 471-474, November 1963.
Goodman, Harold S., and Falk, Robert J.	Temperature control and programmer...	Nature (London) 194: 934-937, June 9, 1962.
Greer, Monte A., and Yowell, Jay H.	Stereotaxic instrument for small animals.	Electroenceph Clin Neurophysiol 14: 417-418, June 1962.
Griffith, Russell, and Harwood, James.	Synthetic polypeptides containing pyridyl groups.	J Org Chem 29: 2658-2662 (1964).
Grosswicz, Nathan, Sulitzeanu, D., and Merzbach, David.	Isotopic determination of vitamin B <sub>12</sub> ..	Proc Soc Exp Biol Med 109:604-608, March 1962.
Hall, Charles T., and Hansen, P. Arne.	Chelated azo dyes.....	Zbl Bakt (Orig) 184: 548-554, February 1962.
Halstead, Ward C., and Green, Elmer E.	Programed input apparatus.....	Doctoral dissertation, University of Chicago, June 1962.
Halstead, Ward C., and Rennick, Philip M.	A digitally programed apparatus for temporal ordering of stimulus sequences.	Do.
Hassner, Alfred, and Haddadin, Makhluif J.	Quinolinoandrostanes.....	J Org Chem 27: 1911 (1962).
Hassner, Alfred, and Michelson, M. J.	Formation of the N-N bond.....	J Org Chem 27: 298-301 (1962).
Heathcock, Clayton, and Hassner, Alfred.	Synthesis of 2-oxazolidones.....	Angew Chem 75: 344-345, June 1963.
Hedbys, Bengt O., and Mishima, Saiichi.	Pachometer.....	Exp Eye Res 1: 262-275, March 1962.
Higgins, Edwin S., and Chambers, Wilbur.	Isolation of beta-1, 4 glucan from an adaptive strain of <i>Aspergillus niger</i> .	Arch Biochem 103: 87-93, October 1963.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Hoffman, Howard S.	The analogue laboratory	Amer Psychol 17: 684, October 1962.
Hollander, Joseph L., and Young, David G.	Palpameter	Arthritis Rheum 6: 277, June 1963.
Hon, Edward H.	Technique for noise reduction in fetal electrocardiography.	Med Arts Sci 15: 120-123, 4th Quart 1961.
Hrubant, H. Everett	An apparatus for applying reagents to paper chromatograms.	J Chromatogr 6: 94 (1961).
Huang, Teh Cheng	A stable reagent for the Liebermann-Burchard reaction.	Anal Chem 33: 1405, September 1961.
Do	A simplified method to determine total and esterified cholesterol.	Anal Chem 35: 1757-1758, October 1963.
Huggins, Charles E.	Reversible agglomeration used to remove dimethylsulfoxide from large volumes of frozen blood.	Science 139: 504-505, Feb. 8, 1963.
Hume, Michael	Radioactive human plasma clot having storage life for assay of fibrinolytic or thrombolytic activity.	J Lab Clin Med 63: 699-702, April 1964.
Inoi, Tokiski	Method for the preparation of o, p' DDD (1,1-dichloro-2, 2(o-chlorophenyl) ethane).	J Org Chem 27: 4597 (1962).
Jernberg, Nels, Eng, B., and Brooks, Vernon.	Differential screwdrive for micro-electrodes.	Electroenceph Clin Neurophysiol 14: 931-933, December 1962.
Jovin, Thomas, Chrambach, Andreas, and Naughton, M. A.	An apparatus for preparative electrophoresis on an acrylamide gel supporting medicine.	Anal Biochem 9: 357-369, November 1964.
Kastenschmidt, Lewis L., Briskey, Ernest J., and Hoekstra, William G.	Prevention of pale, soft, exudative postmortem porcine musculature.	J Food Sci 29: 210-217, May 1963.
Kay, Earle B., and Suzuki, Akio	Artificial heart valves	J Thorac Cardiovasc Surg 45: 372-381, March 1963.
Kjellberg, Raymond, et al.	A method and device for directing the high-energy Bragg peak of particulate radiation from an accelerator to targets within an absorber.	Confid Neurol 22: 183-189 (1962).
Krahl, Vernon E.	Thoracic window and clamp support	Angiology 14: 149-159, April 1963.
Krantz, Kermit E., Panos, Theodore C., and Evans, James.	Extracorporeal circulation of the maternal and fetal systems in the placenta.	Amer J Obstet Gynec 83: 1214-1228, May 1, 1962.
Kuck, Avigdar, Liebman, F. M., and Kussick, L.	Rechargeable implanted transmitter	IEEE Trans Biomed Elect 10: 117-119, July 1963.
Kuhl, David E., and Edwards, Ray Q.	Section radioisotope scanner	Radiology 80: 653-662, April 1963.
Kumar, Soma, and Singh, Visheva Nath.	A simple method for the preparation of C <sub>14</sub> labelled B-hydroxybutyric acid.	Anal Biochem 6: 374-380, October 1963.
Kupchan, Morris	Synthesis of C-nor-D-homotestosterone acetate.	J Amer Chem Soc 86: 701, February 1964.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Law, O. Thomas, and Adams, Jack.	A versatile solderless electrode carrier for brain implantation.	Psychol Rep 13: 539-541, August 1963.
Layton, Richard G., and Eyring, Edward W.	A laser-powered temperature-jump apparatus for measuring rates of very rapid reactions in solutions.	J Chem Educ 40: 338-340, July 1963.
Leach, Franklin R.	Method for the preparation of permanent slides from cell culture cells grown in plastic vessels.	Exp Cell Res 30: 405-409, April 1963.
Leighton, Joseph, and Esper, Martha.	Tissue culture pipette	Public Health Rep 79: 642-643, July 1964.
Lentini, Eugene A., and Guyton, W. V.	Electronic micrometer	J Appl Physiol 18: 636-638, May 1963.
Levin, Gershon, and Brown, George B.	Adenine 1-N-oxide, its sensitivity to ultraviolet light.	Fed Proc 21: 372, March-April 1962.
Lichtenstein, E. P., Strong, F. M., and Morgan, D. G.	Insecticide from edible part of turnips.	J Agr and Food Chem 10: 30-33, January-February 1962.
Lipscomb, Harry S., and Nelson, Don H.	A device for sequential (retrograde) injection and bleeding of small blood vessels in laboratory animals.	Endocrinology 71: 14-23, July 1962.
Maag, Ted A., and Foster, John W.	Explosive decompression apparatus for rupturing bacteria and other cells.	Bact Proc: 51 (1963).
MacCanon, Donald M., Arevalo, F., and Meyer, E. C.	Electrical contactor timing of cardiac valve closure.	Circ Res 14: 387-391, May 1964.
Markowitz, Hal, and Saslow, Michael G.	A silent electronic shock scrambler for behavioral research.	J Exp Anal Behav 7: 267-268, May 1964.
Maurukas, Jonas, and Kairys, Stephas.	Synthesis of DL- $\alpha$ -(dihexanoyl-dioctanoyl-, and didecanoyl)-phosphatidyl DL-serines.	J Pharm Sci 52: 634-636, July 1963.
Maurukas, Jonas, Kairys, Stephas, and Holland, Charles V.	Short-chain fatty acid ( $C_6$ , $C_8$ , $C_{10}$ ) phosphotidyl ethanolamines.	Biochemistry 2: 397-399, March-April 1963.
May, M. Douglas, Diamond, E. Grey, and Trujillo, Josefina.	Inhibition of cholesterol biosynthesis by a dialyzable fraction from beef liver hepatocatalase (caperase).	Biochem Biophys Res Commun 10: 189-194, January 1963.
McGarry, E. E., and Beck, John C.	Physiologic action of highly purified ovine prolactin comparable to human growth hormone in man.	Lancet No. 7262: 915-916, Nov. 3, 1962.
Mehl, John W.	Fraction collector	Anal Biochem 5: 170-174, February 1963.
Nissenbaum, Gerald, DiBianco, John, and Groisser, Victor W.	A new rotating camera bracket for cinefiberscopy.	Amer J Med Electronics 2: 295-299, October-December 1963.
Norman, Charles, et al.	Norman and Johnson's solution (N-J solution).	Amer Zool 1: 117, August 1961.
Nowotny, Alvis H.	Chemical detoxification of bacterial O-antigens and their therapeutic use.	Nature (London) 197: 721-722, Feb. 16, 1963.
O'Connor, Rod, Rosenbrook, William, Jr., and Erickson, Robert.	An electrical device for obtaining pure hymenoptera venom.	Science 139: 420, Feb. 1, 1963.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Osler, Sonia, and Powell, Marshall G.	Apparatus for the study of discrimination and concept formation.	Amer J Psychol 73: 627-629, December 1960.
Pakrashi, Satyesh C., Vorbruegen, Helmuth, and Budzikiewicz, Herbert.	New source of ipecac alkaloids outside ipecacuanha.	Ann Biochem Exp Med 22: 23-24, January 1962; 129-146, June 1962; 23: 285-298, August 1963.
Petrohilos, Harry G., et al.....	A design for a reliable and inexpensive biphasic stimulator.	Electroenceph Clin Neurophysiol 15: 1042-1044, December 1963.
Porter, Huntington, and Johnston, Janet.	Metal-free tube cap assemblies for the Spinco model L preparative ultracentrifuge.	Anal Biochem 4: 81-83, July 1962.
Pradhan, Suresh K., Ringold, Howard J., and Turner, Alan.	A process for the conversion of steroidal-3, 5-enol ethers into 3-keto-4, 6-dienones and into 3-keto-1,4,6-trienones by dehydrogenation with 2,3-dichloro-5, 6-dicyano-1, 4-benzoquinone (DDQ).	J Org Chem 29: 601 (1964).
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**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Smyth, Nicholas P. D., Blades, Brian B., and Barton, William F.	Heat exchange oxygenator.....	Proc Soc Exp Biol Med 112: 808-811, March 1963.
Spear, Andrew F.....	An automatic resetting integrator.....	J Appl Physiol 16: 914-916, September 1961.
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Wilson, Michael F.....	Mutual inductance cardiometer gauge..	Circ Res 11: 90-95, July 1962.

**Table 3. Determinations made by the Surgeon General during calendar years 1963 and 1964 to dedicate inventions by publication—Continued**

Author	Title of invention report	Journal citation
Yanof, Howard M., et al.-----	Hydraulic oscillator or pump-----	Phys Med Biol 8: 408-411, November 1963.
Yoshino, Kamesaburo, and Saito, Katsue.	Antirabies 1-day egg vaccine produced with Nishigshara-0 <sub>30</sub> M strain.	Arch Ges Virusforsch 13: 489-498, Aug. 26, 1963.
Yung, Naishun C., et al.-----	Synthesis of 1-B-D arabanofuranosyl- 5-fluorouracil.	J Amer Chem Soc 83: 4060-4065 (1961).
Zimmer, Hans, and Sill, Arthur D. .	Synthesis of N-mustards derived from diazaphospholes as potential anti- cancer agents.	Naturwissenschaften 49: 256, March 1962.
Zorbach, William W., Saeki, Seitaro, and Buhler, Wolfgang.	Partial synthesis of 6'-hydroxyconval- latoxin, the most potent of all known cardinolides.	Naturwissenschaften 50: 93, February 1963.

### Thyroiditis in Utah and Arizona

A study of thyroid conditions among school students in portions of Utah and Arizona is being conducted by the Public Health Service in cooperation with health authorities of the two States and the University of Utah Medical Center.

The study includes clinical examinations, thyroid function tests, and such data as family history of thyroid abnormalities, dietary habits, and exposure to medical and dental radiation, as well as possible exposure to fallout from atmospheric nuclear tests at the Nevada test site in the 1950's.

No malignant growths of the thyroid gland have been found in any of the Utah and Arizona students. However, the study has revealed cases of thyroiditis, an inflammation of the thyroid which may produce nodules in the gland. Thyroiditis has been specifically diagnosed in five children, and, on the basis of thyroid function tests, it is strongly suspected in at least four other Utah children and three in the Arizona group.

The significance of proved or suspected thyroiditis in the Utah and Arizona children

is not clearly understood. During recent years a general increase in thyroiditis has been noted in several widely separated areas in this country and abroad. To date, no relationship has been established between thyroiditis and exposure to radiation.

Present findings are the result of clinical and laboratory studies recommended by three physicians specializing in thyroid disease who, at the request of the Public Health Service, examined 70 students in Washington County, Utah, and 25 students in Graham County, Ariz. These students were previously identified by teams of Service physicians as having possible thyroid gland nodules. The earlier examinations were made in September 1965, on 2,000 Utah students and 1,400 in the Arizona county. The students were reexamined by the specialists in early November 1965.

The examination by the expert group confirmed for the most part the initial findings of thyroid nodularity and led to the recommendation that further studies be undertaken to determine the nature of the nodules.

**WALLER, JULIAN A.** (California State Department of Public Health): *Use and misuse of alcoholic beverages as factor in motor vehicle accidents. Public Health Reports, Vol. 81, July 1966, pp. 591-597.*

A highly significant correlation has been shown to exist between the ingestion of alcohol by either drivers or pedestrians and the occurrence of traffic accidents. Studies of a person's ability to perform a simulated driving task after drinking have consistently indicated that impairment occurs at blood alcohol levels between 50 and 100 mg. percent. These studies are the basis of current standards by which drivers with blood alcohol levels above 100 mg. percent are considered to be impaired and for the assumption that social drinking is responsible for most alcohol-related traffic accidents. More recent studies, however, of blood alcohol levels actually associated with traffic accidents and of the personal characteristics of drinking drivers and pedestrians involved in such accidents

have identified alcoholism in the majority. Among fatally injured young drivers, in whom low blood alcohol levels are frequently observed, many of the fatalities may be related to social experimentation with the use of alcohol rather than to pathological drinking.

Measures to control the accidents caused by alcohol should include implied consent legislation, earlier identification and referral to treatment of drivers with a drinking problem, teaching young drivers about the hazards of alcohol, improvement of driver training and of vehicle and roadway design, and closer cooperation among Federal, State, and local agencies and the various disciplines in the identification of problems and the initiation and evaluation of control programs.

**SHAIN, MAX** (University of Michigan), and **SOUTHWICK, ARTHUR F.:** *State licensing regulations and hospital liability. Public Health Reports, Vol. 81, July 1966, pp. 581-584.*

A 1965 decision of the Illinois Supreme Court in the case of *Darling v. Charleston Community Memorial Hospital* enhances the effectiveness of State hospital licensing regulations, since it adds the sanction of liability for damages brought about by actions that are not in conformity with such regulations. The case represents one development in a long trend toward strengthening the position of the hospital in the medical care system, this trend being set in motion by technological, economic, and social forces.

Professional organizations have devised organizational forms and established standards of conduct to control hospital practice. These forms and standards have been incorporated in official regulations and are now further strengthened by court application in defining the duties to be considered in negligence cases. The insurance companies that insure the risks of negligence claims against hospitals may be expected to assist in obtaining compliance with the standards embodied in hospital licensing regulations.

**HERNANDEZ, KATHLEEN** (University of Tennessee), and **TOKUHATA, GEORGE:** *Epidemiologic study of childhood leukemia in Memphis and Shelby County, 1939-62. Public Health Reports, Vol. 81, July 1966, pp. 598-606.*

The incidence of childhood leukemia in Memphis and Shelby County, Tenn., for the 1939-62 period was analyzed with respect to race, sex, age, and family economic status. A total of 133 cases of leukemia in persons under 20 years (83 boys and 50 girls, 97 white and 36 nonwhite) were used in the final analysis. Cell types did not differ between the two sexes or between the two racial groups. The incidence of the disease increased markedly after World War II, but the rate has stabilized in more recent years.

While boys had a greater risk of developing leukemia than girls throughout the entire study period, boys also experienced a larger relative increase after World War II. The rate was consistently

higher among white children than among nonwhite children. Among white children, the rate increased faster in boys; among nonwhite children, it increased faster in girls. Although the greatest risk was found in the youngest age group, a large relative increase was observed in the older age groups.

During the earlier study years, the leukemia incidence did not differ between the upper and the lower economic groups. The rate became increasingly higher in the upper economic group, however, during the later study years. The upper economic groups represented almost entirely white children, and the lower economic group, mostly Negro children.

**DEMONE, HAROLD W. (Medical Foundation, Inc.), and KASEY, ELIZABETH H.:** *Alcohol and non-motor-vehicle injuries: Literature review. Public Health Reports, Vol. 81, July 1966, pp. 585-590.*

The Accident Prevention Division of the Public Health Service, the National Safety Council, and many other organizations have intensified accident prevention research in conjunction with the use of alcohol. Increasingly, the relation of alcohol to accidents has been questioned.

To obtain information on research relating to the use of alcohol in non-motor-vehicle accidents, a detailed, although not exhaustive, review of pertinent literature was made. The relation of alcoholism to industrial accidents in three countries, the United States, Germany, and France, was explored. Although study methodologies varied, the major conclusions were that the frequency and seriousness of industrial accidents and the mean number of days lost per accident are greater among alcoholic than nonalcoholic persons.

Only 6 of 11 studies on the nonpathological use of alcohol in relation to industrial accidents were conducted after

1952. Except for one U.S. study conducted in 1915, the consensus was that a definite relation exists between the use of alcohol and industrial accidents, although the exact degree and extent have not been determined.

Information on the relation of alcohol to nonfatal accidents other than motor vehicle or industrial accidents is seriously lacking. Several general studies have been reported concerning alcohol and accidents and alcoholism and accidental injury. None of the studies provide specific data on place of occurrence. Studies of the relation of alcohol to aviation accidents and violent deaths also have been reported.

Two facts stand out clearly: (a) research on the relation of alcohol to accidents outside the parameters of motor vehicle or industrial settings is limited, and (b) well-designed, large-scale research to determine the relation of alcohol to non-motor-vehicle accidents is urgently needed.

**WALLACE, HELEN M. (University of California School of Public Health), and FISHER, SUSAN T.:** *Use of congenital malformation data reported on live birth certificates. Public Health Reports, Vol. 81, July 1966, pp. 631-638.*

The thalidomide tragedy and the more recent rubella epidemic have generated increased interest in early detection and adequate care of infants with congenital malformations. Because of this, a questionnaire survey was undertaken in 1965 among States, territories, and large cities to determine the extent to which information on live birth certificates about congenital malformations is used for epidemiologic surveillance and as a tool for service to the affected infant and family. Responses were received from 52 of 54 States and territories and 123 of 130 cities.

Of the areas queried, 80 percent ask about the presence of a congenital malformation on the live birth certificate. A majority (87 percent of those having certificates containing this question) also request information about the type of malformation.

The information is used by 31 percent of the areas for epidemiologic surveillance, by 45 percent for statistical analysis, and by 64 percent for followup services. Considerable variation was noted in the type of personnel performing the reviews and analyses and in the criteria for selection of infants for followup service.

A comparison of the 1965 findings with those obtained in a similar survey in 1953 showed strikingly similar patterns regarding the number of States and territories which did not request the reporting of congenital malformations on their live birth certificates and the use of information for followup services.

A number of suggestions for improving the completeness and accuracy of reporting congenital malformations on birth certificates are reviewed.

**BOND, J. O.** (Florida State Board of Health), **HAMMON, W. McD.**, **LEWIS, A. L.**, **SATHER, G. E.**, and **TAYLOR, D. J.**: *California group arboviruses in Florida and report of a new strain, Keystone virus: Epidemiologic and virological observations in the Tampa Bay area. Public Health Reports, Vol. 81, July 1966, pp. 607-613.*

The 1963-65 ecologic studies for arboviruses in the Tampa Bay area by the Encephalitis Research Center, Florida State Board of Health, have shown that the California encephalitis group arboviruses are the most commonly recovered viral agents from mosquitoes. Of 27,035 *Aedes* mosquitoes tested in 790 pools during the period January 1963 to December 1964, 41 pools were found to be positive. The trivittatus-like strain was recovered most frequently and predominantly from *Aedes infirmatus* mosquitoes. A newly identified strain, named the Keystone, was obtained from the *Aedes atlanticus tormentor*.

Human disease related to California viruses by serologic tests has been uncommon. Two patients with viral symptoms of the central nervous system were

identified in 618 tested. Human infection without history of central-nervous-system disease was found in 1 to 6 percent of the general population. The authors emphasized the importance of extracting human serums with kaolin rather than acetone to detect specific inhibitor to BFS-283 antigen.

The lower vertebrate source of the California encephalitis group arboviruses in Florida remains unknown. Extremely low rates of hemagglutination-inhibition antibody have been found in mammals. Preliminary serum neutralization tests suggest that most of these are nonspecific. The year-round recovery of the virus from mosquitoes, however, suggests its continual presence in a common host.

**WARD, GERALD M.** (Colorado State University), **JOHNSON, JAMES E.**, and **WILSON, DANIEL W.**: *Deposition of fallout cesium 137 on forage and transfer to milk. Public Health Reports, Vol. 81, July 1966, pp. 639-645.*

Milk samples were collected from 12 cows on pasture and 100 fed on drylot in 1962, 1963, and 1964 at Colorado State University. Concurrent samples of feed intake and milk production from each cow, daily air samples, and samples of each rainfall were collected. All samples were analyzed for cesium 137 content. Deposition of cesium 137 in rainfall ranged from 300 to 7,000 picocuries per square meter and on alfalfa hay from 60 to 1,640 picocuries per square meter. Deposition coefficients ranged from 0.06 to 0.37.

The maximum levels of cesium 137 in milk from cows fed on pasture were about 200 picocuries per liter in 1962 and 1963, while the maximum levels in milk from cows fed on drylot were about 170 picocuries per liter. Levels of cesium 137 in milk were lower during the winter months because third-cutting hay, with low cesium 137 activity, usually was fed to all the cows. Transfer coefficients, the percentage of ingested cesium 137 found per liter of milk, were higher for high-grain diets (0.58) than for predominantly hay diets (0.24).

**STONE, WARD B.** (Syracuse University), and **MANWELL, REGINALD D.**: *Potential helminth infections in humans from pet or laboratory mice and hamsters. Public Health Reports, Vol. 81, July 1966, pp. 647-653.*

A study of intestinal parasites was made on 202 mice and 58 hamsters obtained from vendors to laboratories and from the Syracuse University zoology department's animal room. Also surveyed were 58 mice and 27 hamsters sold as pets.

*Syphacia obvelata* parasitized 75 percent of the mice and 60 percent of the hamsters from commercial dealers and the animal room. Also infected with *S. obvelata* were 53 percent of the mice and 78 percent of the hamsters sold as pets.

*Aspiculuris tetraptera* was found in 30 percent of the mice from laboratory suppliers and 62 percent of those from pet dealers.

*Hymenolepis nana* parasitized 21 percent of the mice supplied for laboratory

use and 66 percent of those sold as pets. Hamsters from pet shops and department stores were 44 percent parasitized by *H. nana*, and those obtained from commercial dealers and the animal room had an overall infection rate of 9 percent.

Because *H. nana* is infective to man, the high incidence of this parasite in pet and laboratory rodents is important. The heavy parasitization of rodents from pet stores was consistent with the unsanitary conditions under which many of the animals were kept.

It is almost impossible to obtain routinely parasite-free hamsters and mice for research. Some of these parasites may act as variables in investigations, and researchers should be aware of their presence.